

Spring 4-1924

## Volume 33 - Issue 7 - April, 1924

Rose Technic Staff

*Rose-Hulman Institute of Technology*

Follow this and additional works at: <https://scholar.rose-hulman.edu/technic>

---

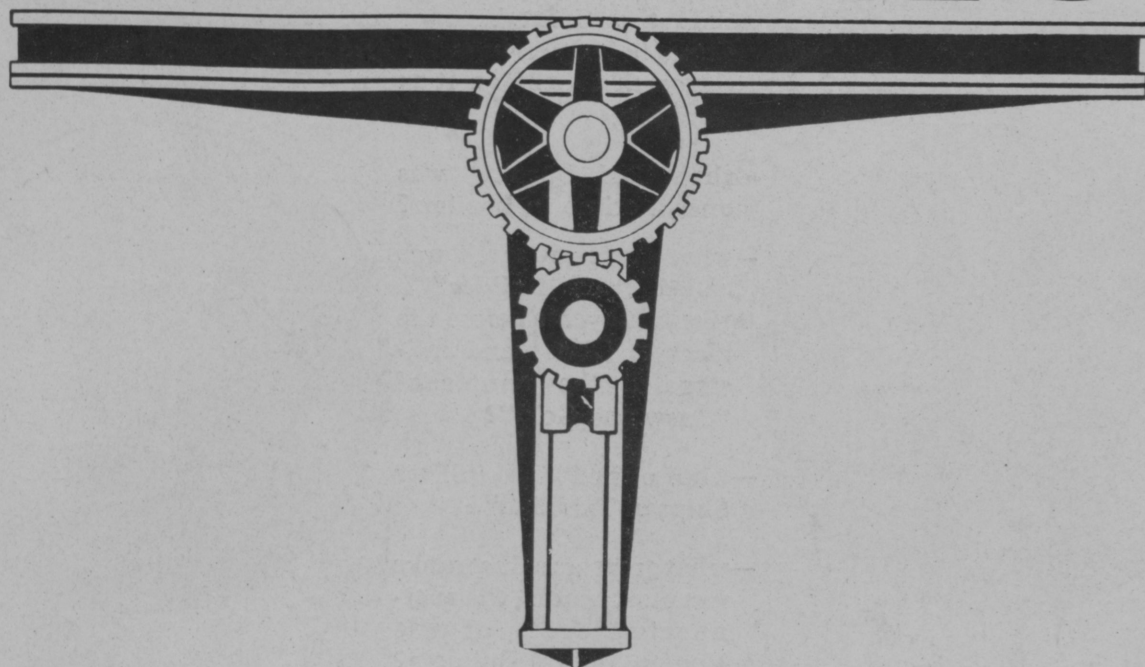
### Recommended Citation

Staff, Rose Technic, "Volume 33 - Issue 7 - April, 1924" (1924). *Technic*. 416.  
<https://scholar.rose-hulman.edu/technic/416>

Disclaimer: Archived issues of the Rose-Hulman yearbook, which were compiled by students, may contain stereotyped, insensitive or inappropriate content, such as images, that reflected prejudicial attitudes of their day--attitudes that should not have been acceptable then, and which would be widely condemned by today's standards. Rose-Hulman is presenting the yearbooks as originally published because they are an archival record of a point in time. To remove offensive material now would, in essence, sanitize history by erasing the stereotypes and prejudices from historical record as if they never existed.

This Book is brought to you for free and open access by the Student Newspaper at Rose-Hulman Scholar. It has been accepted for inclusion in Technic by an authorized administrator of Rose-Hulman Scholar. For more information, please contact [weir1@rose-hulman.edu](mailto:weir1@rose-hulman.edu).

# THE TECHNIC



ROSE POLYTECHNIC  
INSTITUTE

VOL. XXXIII

APRIL, 1924

No. 7

Member of Engineering College Magazines Associated





# Do You Know



—who were the Copper Miners of the Stone Age?

—that the Great Wall of China is long enough for the earth to spin on it as an axis?



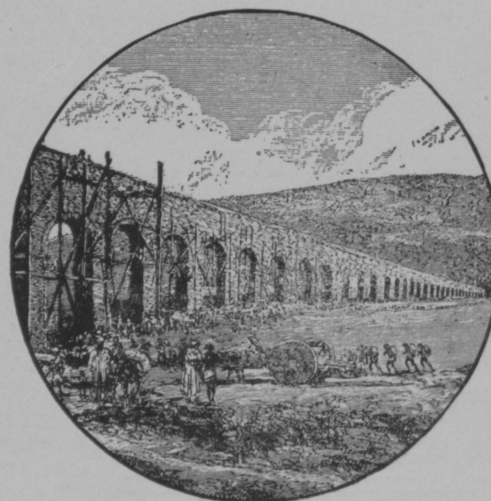
—that Coal Burning was once a crime in London?

—what great monarch was called “the Builder” a thousand years before the birth of Christ, and constructed the temple of “Snow and Gold”?



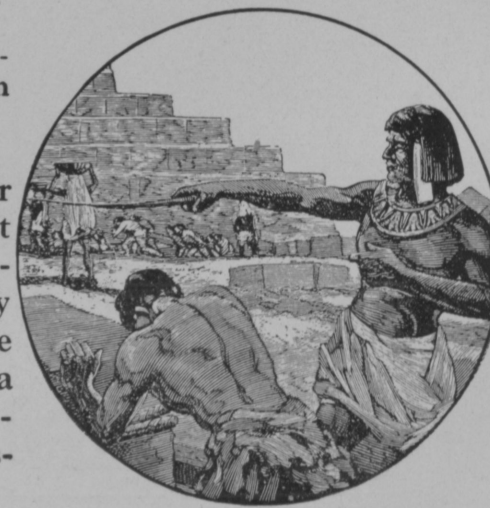
—who owned the “Silver Ships of Tarshish”?

—what great aqueduct ranks foremost among the engineering feats of the Roman Tunnel Builders?



—who made the most productive fishing trip in history?

These, and many other interesting facts about the difficulties encountered and overcome by the great builders of the past, are contained in a new and unusually attractive 62-page illustrated book entitled:



## “Conquering the Earth”

Write to the Hercules Powder Company’s advertising department, 941 King Street, Wilmington, Delaware, for a free copy of this book, which you will want to place in your library at home.



Vol. XXXIII

TERRE HAUTE, INDIANA, APRIL, 1924

No. 7

## THE TECHNIC

MEMBER OF ENGINEERING COLLEGE MAGAZINES ASSOCIATED

PROF. EDWIN KURTZ, Chairman.....Iowa State College, Ames, Iowa.

A monthly magazine published nine times from October to June, inclusive, by the student body and Alumni of Rose Polytechnic Institute.

### Other Members Are

The Transit.....	Towne Scientific School Journal	Nebraska Blue-Print.....	Minnesota Techno-Log
Colorado Engineer.....	Tech Engineering News	Wisconsin Engineer.....	Illinois Technograph
Sibley Journal.....	Cornell Civil Engineer	Penn State Engineer.....	Ohio State Engineer
Iowa Engineer.....	Kansas State Engineer	Princeton E. A. News-Letter.....	Michigan Technic
Armour Engineer.....	University of Virginia	Journal of Engineering.....	Purdue Engineering Review

### EDITORIAL STAFF

Harold B. Hood, '24.....	Editor-in-Chief
Milton E. Feldstein, '25.....	Managing Editor
John M. Barr, '25.....	Alumni
Orville M. Dunning, '25.....	Technical Exchange
Lewis J. Sisson, '26.....	Jokes
Sam Forsythe, '24.....	Athletics
John Shaw, '25.....	Campus Notes

### BUSINESS STAFF

Carson W. Simms, '24.....	Business Manager
Roger Bolin, '25.....	Advertising Manager
Wayne E. Watkins, '26.....	Asst. Advertising Manager
Ed. Dunning, '27.....	Asst. Advertising Manager
Clay P. Watson, '24.....	Circulation Manager

Address all communications to  
THE ROSE TECHNIC,  
Terre Haute, Indiana.

### Terms of Subscription

One Year .....	\$2.00
Single Copy .....	.30

Recognized by the Terre Haute Retail Merchants' Association as an Advertising Medium.

Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized December 13, 1918.

## Summary of Contents

RADIO FOG SIGNALS AND THEIR USE.....	3
ARTISTRY AND DEVOTION IN SALESMANSHIP .....	6
ALUMNI NOTES .....	7
ATHLETIC FORECASTS .....	8
JUNIOR PROM .....	9
HEARD ABOUT SCHOOL.....	9
IS THE SPECTROSCOPE A DETECTIVE?.....	10
FRATERNITY NOTES .....	10
PROGRESS IN USE OF RADIO SIGNALS.....	11
BILL CHANGES GIRLS AGAIN.....	13





EDMUND HALLEY  
1656-1742

Son of a London soap-boiler who became Astronomer-Royal. At the age of 20 headed an expedition to chart the stars of the Southern hemisphere. Financed and handled the printing of Newton's immortal *Principia*.

## The comet came back

The great comet that was seen by William of Normandy returned to our skies in 1910 on its eleventh visit since the Conquest. Astronomers knew when it would appear, and the exact spot in the sky where it would first be visible.

Edmund Halley's mathematical calculation of the great orbit of this 76-year visitor—his scientific proof that comets are part of our solar system—was a brilliant application of the then unpublished *Principia* of his friend Sir Isaac Newton.

The laws of motion that Newton and Halley proved to govern the movements of a comet are used by scientists in the Research Laboratories of the General Electric Company to determine the orbit of electrons in vacuum tubes.



As spectacular as a comet has been the world's electrical development. By continuous scientific research the General Electric Company has accelerated this development and has become a leader in the industry.

# GENERAL ELECTRIC

---

# THE ROSE TECHNIC

Published by the Student Body of Rose Polytechnic Institute

VOL. XXXIII

APRIL, 1924

No. 6

## RADIO FOG SIGNALS AND THEIR USE IN NAVIGATION IN CONNECTION WITH THE RADIO COMPASS

*George R. Putnam, '90*

**T**HREE radio fog-signal stations in the vicinity of New York were placed in commission by the Lighthouse Service on May 1, 1921, these being the first service installations of this kind in the United States. The following account gives a general description of these signals and their purpose and development:

### System of Navigation by Radio Direction Signals

This system is based on the equipment of selected important lighthouses and light vessels along the coast with apparatus for sending radio signals of simple and definite characteristics during the continuation of fog or thick weather, by means of which the navigator of any vessel provided with a radio compass may take definite bearings to guide or to locate his ship, although no object is visible. The most valuable use of the radio fog-signal will probably be as a leading mark, as, for example, to enable a vessel to make a lightship anchored in the approach to a harbor or to pass outside of a lightship anchored to guard against dangers off the coast. The navigator will also be able, as in navigation using visible objects, to locate his ship by cross bearings on two or more radio stations or by repeated bearings on the same station with the distance logged between bearings, or by a single bearing and dead reckoning. This system, for the first time in navigation, affords a practicable means by which the navigator can take reasonably accurate bearings on fixed beacons which are not visible. Its prospective importance is due to the fact that one of the greatest needs for increasing safety of navigation is improved means to enable a mariner to guide and to locate his vessel in thick weather when he can see no lights or landmarks.

Another very important use will be to enable vessels to locate each other when meeting, approaching, or needing assistance in fog. Two striking illustrations of the importance of radio bearings in rescue work at sea have recently been reported. The Norwegian steamer *Onataneda* was in distress off Newfoundland and gave her position by dead reckoning 90 miles in error. The only ship able to discover her correct position was the steamship *Fanal Head*, equipped with a radio direction finder, which was thereby enabled to save the lives of those on board the

*Onataneda*. The steamer *Wahkeena* was within 14 miles of the steamer *Alaska*, recently lost off Cape Mendocino, California, when she picked up the radio distress signals of the *Alaska*, but it was 10 hours before the *Wahkeena* reached the scene of the wreck, having no means of determining the direction of the signals; many lives might have been saved, first, had there been a radio fog signal on Blunts Reef Light Vessel and radio compass on the *Alaska*, and, second, had there been a radio compass on the *Wahkeena*.

### Sending Stations Established and Their Characteristics

The three stations for sending radio fog signals now in commission are Ambrose Channel Light Vessel, Fire Island Light Vessel, and Sea Girt (N. J.) Light Station. These stations were selected so as to enable vessels approaching or leaving New York to locate themselves conveniently by cross bearings and to furnish convenient leading marks to approach the harbor. The stations are identified by the characteristics of the signals, thus Ambrose Channel sends one dash, Fire Island a group of two dashes, and Sea Girt a group of three dashes, with brief intervals between the groups. The particular station on which a radio bearing is being taken in a fog is by this means just as definitely known as is the light on which a sight bearing is taken by the navigator of a ship identified by its order of flashes or color. The signals are operated continuously during thick or foggy weather, and also at the present time they are sent each day from 9 to 9:30 a. m., and from 3 to 3:30 p. m., so as to permit any vessel equipped with radio compass to try out the method and apparatus in clear weather. To avoid continuous interference between the signals themselves they are sent on different time schedules as follows: Ambrose sends for 20 seconds, silent 20 seconds; Fire Island sends for 25 seconds, silent 25 seconds; Sea Girt sends for 60 seconds, silent 6 minutes. The signals are repeated rapidly, Sea Girt, for example, sending over 40 groups of dashes a minute.

The transmitting apparatus now in use is a commercial panel type transmitting set of simple and rugged construction of about 1 kilowatt power. In addition to this set, a special automatic motor-driven



timing switch for producing the desired signal at regular intervals is provided. The antennas at the transmitting stations are the same as used for ordinary radio communication. The wave length used at present is 1,000 meters, the present international standard for such signals, and the range of usefulness varies from 30 to 100 miles, depending upon the sensitiveness of the receiving apparatus.

### The Radio Compass on Shipboard

The method of radio direction finding, or radio fog signals, which has been developed by the Bureau of Standards and the Lighthouse Service, is based on the peculiar properties of the so-called coil aerial when used for the reception of radio signals. This coil consists of about 10 turns of insulated copper wire upon a rotatable wooden frame approximately 4 feet square. When the plane of the coil is parallel to the direction from which the radio signal emanates, the intensity of the signal received will be a maximum. As the coil is revolved, the intensity of the signal diminishes until a minimum is reached when the plane of the coil comes to a position at right angles to the line of direction from the signal. This minimum, which is well defined, may be determined with sufficient accuracy for navigational purposes and is used in taking radio bearings.

The coil aerial mounted upon a vertical spindle provided with a pointer, and a graduated circle below the pointer for determining the position of the coil with respect to a known direction, constitutes what is known as the radio compass or radio direction-finder. This apparatus, and the necessary radio-receiving device, are installed on the vessel, preferably in a position easily accessible to the navigator.

In the installations which have been made on lighthouse tenders, the coil is mounted on the roof of the pilot house. The spindle extends through the roof and is provided with a handwheel for rotating the coil. The lower end of the spindle terminates directly above the center of a standard ship's binnacle and carries a pointer so arranged that the position of the coil may be read directly upon the compass card, thus giving the magnetic bearing of the radio signal station at a glance when the minimum point is reached.

After the radio-direction finder has been installed on the vessel, a careful calibration is necessary to eliminate errors caused by distortion of the radio signal by the vessel itself. Simultaneously radio bearings and sight shots with an azimuth circle are taken on a convenient radio-signal station at intervals of approximately  $5^\circ$  while the vessel is swung several times in a complete circle. The deviation of the radio bearing from the true bearing is thus obtained for all positions of the coil with respect to the ship's axis. These corrections are then recorded on a circular frame of metal attached to the top of the binnacle and surrounding the magnetic compass, and applied to all subsequent readings of the radio-direction finder.

The ordinary telephone receivers, if used by the operator of the direction finder, by reason of their close proximity to the magnetic compass, would cause a deflection of the needle. This difficulty is overcome by installing a special receiver at some distance from the magnetic compass, and conducting the sound therefrom to the operator by means of rubber tubing.

The radio compass may also be mounted independ-

ently of a magnetic compass, over a fixed scale, graduated in degrees, and set with  $0^\circ$  for the ship's head. Radio bearings taken on this scale will give the angular difference between the ship's head and the bearing of the radio-signal station. By observing simultaneously the radio bearing of the ship's head by magnetic compass, the magnetic bearing of the radio fog-signal station is readily obtained after the manner of taking bearings with the pelorus, corrections being made for the radio bearings as mentioned in a preceding paragraph. This mounting of the radio compass will be less expensive, but also somewhat less convenient and more liable to small errors.

In order to obtain satisfactory results from radio-compass navigation it is essential that the compass be properly constructed, installed, and calibrated, and that only receivers and amplifiers of the special type required be used in connection therewith. Until commercial apparatus of this nature has been standardized and tested, care should be exercised to avoid the installation of compasses of improper design. Specifications for the construction of the improved form of radio compass have been prepared by the Bureau of Standards.

Precaution must be taken by the navigator in applying bearings taken at any considerable distance to ordinary navigation charts on the mercator projection, as the line of bearing on such a chart is not a straight line excepting in the meridian, and suitable corrections must be made.

### Advantages of This System

The following is a brief summary of some of the advantageous features of this system of radio-direction finding:

(a) The navigator can obtain bearings himself, he can do this promptly and as needed, and is not dependent upon others for the accuracy of the results. The master of the lighthouse tender Tulip has for some time been regularly using the radio compass in navigating the vessel under conditions of low visibility; he has taken the bearings himself, although without any special radio training, and has found the instrument to be most helpful and reliable.

(b) Any number of vessels may obtain bearings simultaneously and as frequently as may be desired.

(c) No knowledge of radiotelegraphy is necessary on the part of the navigator.

(d) Use of the radio signal as a leading mark for which to steer directly, or to keep outside of.

(e) The direction finder may be used for locating other vessels at sea, for preventing collisions in fog, or for seeking vessels in distress.

(f) The transmitting stations, being automatic, may be operated by employees of existing lighthouses or light vessels, thus avoiding the necessity of additional personnel.

(g) This method has a strategic value, as a vessel can get bearings without disclosing its own position. As opposed to this is the fact that the shore sending stations are more apt to be disclosed and might be useful to an enemy.

### Historical Note

The important possibilities of utilizing the directive element of radio signals for the location of vessels in fog were early recognized. This subject was mentioned in the Lighthouse Service Bulletin in 1912 and in the annual report for 1913. The service application



of the principle was dependent, however, on the improvement of the radio compass, and its successful use in this country has been rendered possible by extensive investigation of the subject by the Bureau of Standards, resulting in the development by that bureau of a simple and efficient radio compass suitable for use on shipboard.

Faraday's discovery in 1831 of electromagnetic induction was a basic step leading to the present development. The use of a coil for determining the direction of radio waves was developed by Hertz in 1888, and numbers of experimenters have worked on the problem since that time.

The French lighthouse service established in 1912 at two lighthouses on the French coast stations sending distinctive radio fog signals on a wave length of 80 meters. These were stated to be experimental and are still so listed.

In 1915 and 1916 a more effective radio compass was developed at the Bureau of Standards by F. A. Kolsster, and in January, 1917, the Lighthouse Service and Bureau of Standards carried out tests of a radio sending station installed at Navesink Lighthouse, N. J., and a radio compass installed on the lighthouse tender Tulip, with promising results. Further development for the purposes of the Lighthouse Service was deferred during the war, but was again taken up in 1919. In October and November of that year these two services installed three experimental radio fog-signal sending stations at three lighthouses in Chesapeake Bay, and an improved radio compass on the tender Arbutus, and a number of tests were made with satisfactory results. During the following year the apparatus was improved, and equipment was installed at the three stations in the vicinity of New York Harbor described herein. Tests of these stations were made in September, 1920, and later, and they were placed in regular operation May 1, 1921, and notice to mariners issued of their availability. A demonstration of their operation was given on the lighthouse tender Tulip June 27 and 28, 1921.

A number of tests have been made by the Navy, in co-operation with the Lighthouse Service, of a radio distance-finding apparatus, intended to permit a vessel to obtain its distance from a light vessel or other sending station by the difference of time of receipt of two signals sent simultaneously, one by radio and the other by submarine bell or other means. Such a test was made September 10, 1911, in the vicinity of Nantucket Light Vessel. An apparatus for this purpose was installed on Fire Light Vessel, and notice to mariners published June 10, 1917; it did not come into use as an aid, and has been discontinued. A radio telephone for the purpose of sending out warnings effective within a moderate distance was installed at Point Judith Light Station in August, 1917. It has since been discontinued.

During the World War considerable use was made abroad of radio compass stations located on shore for obtaining bearings of ships and furnishing this information for use in navigation, especially of naval vessels. After the war the Navy Department established such stations on the coast of the United States, to be operated in conjunction with the naval communication stations already existing. An extensive and successful test of a number of these stations was made with the cruiser Chicago in May, 1919. A number of such stations are now in active operation on both the

Atlantic and Pacific coasts, and are furnishing many bearings to ships asking for them. These stations are usually arranged in groups. The system is the reverse of that employed by the Lighthouse Service at its stations in which the navigator determines the position of the ship itself.

### Elementary Explanation of the Principles of Operation of the Radio Compass.\*

\*Mainly from the Bureau of Standards notes.

The coil type of antenna used as a radio compass has strongly marked directional properties. Radio waves have the properties of the more familiar kinds of waves, but travel with a velocity of 300,000,000 meters per second. A radio wave from a transmitting station spreads out symmetrically from the station with uniform intensity, very much as waves spread out on a quiet pond when a stone is dropped in. In a given direction from the transmitting station, at a given instant the distance between successive wave crests is the wave length. Radio waves are accompanied by a magnetic force, which is horizontal and at right angles to the direction in which the waves are traveling. As a radio wave passes a given point, the magnetic force or field strength varies from moment to moment from a maximum in one direction through zero to a maximum in the other direction. At a given point, the cycle from maximum in one direction back to maximum in the same direction is performed in a very small fractional part of a second. For a wave length of 300 meters, this cycle is performed in one one-millionth of a second.

If a coil of wire is moved through a magnetic field, such as the field between the two poles of a horseshoe magnet, a voltage of electromotive force is induced in the coil. To accomplish this, the coil must be held in such a position that its plane is not parallel to the lines of magnetic force. It is necessary for the lines of magnetic force to pass through the area inclosed by the wires forming the coil. If the coil is held in a fixed position while the magnetic field threading through it is caused to vary in intensity, an electromotive force or voltage will soon be induced in the coil. In this case, as well as in the case of the coil moving through the steady magnetic field, the coil must be held in such a position that the lines of magnetic force thread or pass through the coil and are not parallel to the plane of the coil.

The magnetic force is horizontal and at right angles to the direction in which the wave is traveling. Therefore when the coil is pointed in the direction in which the wave is traveling it is threaded by the maximum number of magnetic lines of force, and the signal heard in the telephone receivers is a maximum under these conditions. When the coil is turned at right angles to the direction of travel of the wave, no lines of magnetic force pass through the coil, and no signal will be heard in the receivers. At positions intermediate between these two, the voltage induced in the coil varies with a relation similar to the simple resolution of forces in mechanics.

The direction of the transmitting station is most accurately determined by observing the position of the coil when the received signal is a minimum, since this position is much more sharply defined than the position at which the maximum signal is obtained.

(Continued on page 20)

## ARTISTRY AND DEVOTION IN SALESMANSHIP

[By T. H. Bailey Whipple]

WHY do so many salesmen fail to achieve high success in their chosen vocation?

In considering this subject, let us eliminate those possessing a low or even an average native capacity, and those of very meager culture, because concerning such the answer to the question is too obvious to justify discussion. Let us consider only those of real capacity; those of more than the usual culture and education; those who are more than ordinarily in earnest, and who have proved themselves to be not slothful in acquiring knowledge by the "filling-in" or usual process, and whose perceptive faculties are active; those who really have a very thorough knowledge of the products they offer for sale, and much auxiliary commercial, general and even technical information. Let us also consider salesmen of character much above the average, and who industriously cover their territories and daily send in reports of the day's doings. Let us even go further and consider only those who have carried their mental industry to the point of rather thorough analysis of their product, their territories, and many other commercial features embodied in the equipment of an aspiring salesman.

Also, let us consider those who are self-possessed and more than usually fluent in talking their goods. To make the case stronger, let us include in this equipment salesmen of pleasing personality, who are real friend makers; let us repeat our question, why do so many salesmen of such qualities and qualifications fall short of the "top-notch" class?

Many answers have been given, all true, so far as contributory truth is concerned, such as:

The pitch of enthusiasm being just a little too low.

Tact not quite sufficient.

Aggressiveness not quite strong enough.

Judgment a little short of the necessary balance.

Intuitive recognition of psychological moment not strong to the point of positive assurance.

Courage or tact or both not sufficiently active when the psychological moment is discerned.

Abstraction or too great intensity of earnestness blinding one to quick discernment of the psychological moment.

Balance between dignified independence and persuasive persistence not effectively adjusted.

The relation between familiarity of friendship and valid business motive not definitely differentiated.

Taking a little too much or not quite enough for granted.

Over-credulity in relying upon promises of future action.

Over-confidence that fails in applying methods of sustained dynamic action.

Too much time spent with favorite customers to permit of creating the most new ones.

Poor judgment in adjusting efforts effectively between the entire line and selected products to be specially featured.

Many other minor shortcomings, the multiplicity of which are cumulative in negative effect, although

individually hardly pronounced enough to be vividly recognizable in the field of the salesman's own consciousness, but while carrying him to the threshold of high success fail to carry him across it.

Again our question, what is the cause or principle underlying this failure to carry this success of more than the usual standard to the point of very unusual achievement? If we will omit the consideration of superlative success, the result of genius itself, we may justly conclude that the failure under consideration is not the result of intellectual limitation, nor of inadequate ambition so far as the development of the thinking power is concerned, but rather because of an emotional inappreciation which fails to awaken the real devotional attitude from which all highly artistic performance emanates. This element of devotion to one's life work is an instinct, an impelling force, an aesthetic taste, susceptible to training and concomitant to all high expression of art, for art itself is the offspring of devotional intensity.

When we have this spirit of devotion, this pride of performance, even though our talent is not of the superlative kind, we will fight obstacles, glory in sacrifice, if necessary, and will realize with Michael Angelo that "Trifles make perfection, and perfection is no trifle." We cannot implant within ourselves the embryo of genius, but if possessing a fair measure of talent, we can arouse and develop this talent by patient and unremitting industry. We have a "thinker," and should teach ourselves to think, just as we teach our hands to employ tools skillfully if work of high handicraft is to be accomplished. Salesmen not only do not regard themselves seriously enough, but they also fail adequately to estimate the dignity of their art. The same neglect practiced by salesmen in treating the many features of artistic expression, would wholly disqualify an actor for service in any reputable company of dramatic players.

How many salesmen "suit the action to the word"? How many ignore enunciation, inflection, and intonation of voice? How many strike keys with mechanical precision, but overlook the interpretive touch? How many, although not careless in phraseology and diction, yet fail to cultivate a style of expression harmonizing with the best in their own personality? How many, having even the rare accomplishment of excellent and distinctive style, yet fall short of forceful action? How many possessing skill in diction, phraseology, style and action, yet are not strong enough in poise and reserve power? How many proceeding under the actuating impulses of necessity, duty, and even pride of performance itself, yet lack in real devotion to their work?

Devotion, like prayer, is rewarded more in subjective influence than by direct objective result. This dominating influence is susceptible of cultivation. Good taste, progressively cultivated, will gravitate toward it under the action of self-imposed tasks, sustained by the will and moulded by habit. Says Wm. Hanna Thompson, M. D., in speaking of the brain: "Another important conclusion is led up to by these facts, namely, that we can make our own brains, so

(Continued on page 19)



## ALUMNI NOTES

## 1904

Robert D. Landrum, B. S. '04, M. S. '09, and ChE. '14, has recently been honored by being elected to the Presidency of the American Ceramic Society. Mr. Landrum was in the employ of the Columbian Enameling and Stamping Company for three years after graduation, and then went to the University of Kansas where he served as Assistant Professor of Chemistry for another three years. In 1910 he returned to business life and served as Chemical and Consulting Engineer to different companies engaged in the manufacture of enamel ware. He has published more than sixteen articles in technical papers dealing with the various processes in enamelling and has achieved an enviable position in his chosen field. Some of his papers have been translated into foreign languages. We extend our congratulations to Mr. Landrum.

## 1909

Paul E. Strouse, who attended the Institute from 1906 to 1909, has been making good in the west. While working for the American Beet Sugar Company at Rocky Ford, Colorado, he was loaned to the farmers to re-build the head gate of a canal. His work was so satisfactory that it led to his employment as City Engineer of Rocky Ford, in the construction of a new water works system, involving an expenditure of something over \$400,000,000. The work is being done by the city under the direction of Mr. Strouse instead of being contracted for.

## 1911

Henry R. Voelker, formerly located at Logansport, Indiana, has been transferred to Richmond where he is General Foreman of the Richmond Division of the Pennsylvania Railroad.

University of Oregon Juniors had their annual Shine Day recently. On this day all, including co-eds, shine their fellow students' shoes for the usual charge of ten cents. The proceeds go to charity.

Fordham University recently inaugurated something new in the debating line. The subject under discussion was: Resolved: that Fordham should be made a co-educational institution. The affirmative gave as their main argument the fact that the Fordham spirit would be much more in evidence at games, if the ladies were present, whereas the negative painted a doleful picture of the financial burdens which would come upon Fordham by the erection of new buildings. Needless to say, the affirmative won.

The latest wrinkle in university education has been inaugurated at the University of Chicago where day and night courses in meat packing are now being offered. Mr. Lowenstein, vice-president of Wilson & Co., heads the endowment list with a fund of \$2,500 a year, for three years, to establish a research fellowship in the new course.

—Polytechnic Reporter, Brooklyn Poly.

## 1913

C. E. Reese, Gas and Electrical Engineer, has been appointed General Manager of the Bluefield Gas & Power Co., Bluefield, W. V., by Mr. Walter Whetstone, President of the Southern Gas & Power Corporation. This is a Sanderson & Porter property. Mr. Reese has been connected with the Westinghouse Electric & Mfg. Co., as Section Head, Stoker Sales & Publicity Department, Philadelphia, Pa. He has been actively engaged in the Stoker Manufacturers' Association as Secretary of the Publicity Committee and Chairman of the Advertising Sub-Committee. He is an Associate Member of the American Institute of Electrical Engineers, Member American Gas Association, formerly Cadet and Combustion Engineer with Henry L. Doherty & Co., New York City; Assistant Engineer with the Illinois Public Utilities Commission working in Springfield and Chicago, and later Associate Editor of The Gas Age and Gas Age Record and Editor of the Gas Engineering & Appliance Catalog of New York City.

## 1915

A card was received a few weeks ago from Mr. and Mrs. Warren F. Turner announcing the birth of Jane Susanne on March 4th. More congratulations. Mr. Turner is Manager of the Monroe Electric Company, at Monroe, Wisconsin.

## 1920

Erwin ex-'20, has written from the U. S. S. Tennessee at Viequez Sound, Virgin Islands. He is planning to enter Georgetown University in the fall.

## 1921

George H. Defel visited the Institute on March 29th. He is teaching Mathematics and Physics in the High School at Washington, Indiana.

## 1923

Wolff is now in the Student Training Course of the Westinghouse Electric and Manufacturing Company, at East Pittsburgh.

Buffo, Donham, and McComb are living together at 6524 Normal Avenue, Chicago.

The Moore School of Electrical Engineering of the University of Pennsylvania was officially opened on February 6th, during the mid-winter meeting of the A. I. E. E. This school is the enlargement of the Electrical Engineering Department of the University of Pennsylvania into a separate school, being increased by the legacy of Alfred Fitler Moore. One of the two speakers at the formal opening was Dean Arthur M. Greene, Jr., of Princeton. The subject of his address was "Engineering Education—Its Present State and Ideals."

—Princeton News.  
—Princeton News Letter.



Spring Football

On every day for the past two weeks that weather conditions permitted. Coach Clark has had his grid-iron hopefuls at work. A lot of good licks were put in, and the Engineers will undoubtedly have a formidable eleven groomed for action in the first game against Indiana University next Fall.

#### Track

While unable to work to any extent out of doors, the track candidates are working faithfully and will be in shape for the first meet, April 12, against Eastern Illinois State Normal. It is not possible, at present, to make any predictions for the season's success, but a number of candidates are showing to advantage, with White, Withrow, Aker, Schoonover, Watson and Aitken topping the list as Varsity timber.

#### Baseball

A return of chilly blasts and heavy snow-flurries put an end to outdoor baseball work, but Coach Clark has had his proteges busy at the batting nets indoors.

Dick Brettell, '24, was chosen captain of the team by the two remaining letter men, Campbell and Downen. He is a good player and will undoubtedly make a good leader on the diamond. A number of candidates are showing to good advantage, but the pitching staff is the biggest worry. The loss of Staggs and Fox, Varsity pitchers of last year, has crippled that end of the machine to a bothersome extent. Fisher and Garret are, seemingly, the best of the flingers showing to date, and will probably bear the brunt of the mound duty. Garret has had considerable college and independent experience, and possesses a wicked curve ball as well as an ability to run the bases at record speed, together with the eye and arm to furnish opportunities for a display of that speed.

The schedule, as received from Coach Clark, is as follows:—

April	8—E. I. S. N.	Terre Haute
	11—Wabash	Crawfordsville
	15—Merom	Terre Haute
	21—Wabash	Terre Haute
	28—Normal	Terre Haute
May	3—Butler	Indianapolis
	7—E. I. S. N.	Charleston
	13—Merom	Merom
	20—Normal	Terre Haute

Butler is at the present time raising funds for additional endowment and building. An entirely new college plant is to be built at Fairview this year. A definite style of architecture is to be chosen and adhered to in the future in order that the campus may present an ordered appearance. To choose the style, the architects are investigating other college buildings in the country.

The new plant is to be designed to accommodate 2,000 students. Officials hope to raise the necessary amounts before time for the actual construction to begin. About \$600,000 is to be appropriated for the administration building alone.



Basketball

Basketball letters and sweaters were awarded to the following men:—Captain Skeeters, Captain-elect Anderson, Downen, Watson, Fisbeck, Schoonover and Wilson. The Engineer season was one of ups and downs, with the final percentage-sheet showing one game short of .500.

C. "Swede" Anderson should make a capable and heady leader next season, and there should be excellent material from which he and Coach Hezlep can build a real team.

#### Seniors Win Inter-Class Meet

In the inter-class basketball games, the Seniors were victorious, winning three successive battles, while each of the underclass teams won one and lost two. Skeeters, Watson, Bogardus, Wilson, Downen and Fischer were the "big guns" for the men of '24, and, considering the fact that four of them are Varsity men, they made quite a formidable array for the youngsters to bump into. The Seniors received a beautiful trophy cup as their reward.

#### A NEW MAGNETIC MATERIAL

Perhaps we do not give due credit to the scientists who spend years in the accumulation of data or the investigation of problems of a theoretical nature, while other men are building bridges or running department stores. When we realize that all of our scientific and engineering knowledge is the result of their labors, their tremendous value is not disputed and we look hopefully to them for the solution of the perplexing problems of today.

As an example of the result of research work and its application to industry, mention may be made of a remarkable magnetic alloy, a detailed description of which appeared in the Journal of Franklin Institute. It has long been realized that a material of high permeability at low flux densities would be of great value in telephone and cable work where the currents are extremely minute. The new alloy called "Permalloy" consists of about 80 percent Ni and 20 percent Fe and has a permeability at zero magnetizing force of as high as 13,000 or 30 times the value for the best iron. The maximum permeability runs as high as 85,000 or better than for silicon steel. In spite of the high saturation value, about 11,000 gauss, the metal is nearly saturated in the earth's field. The area of its hysteresis loop is only one-sixteenth that of iron, making it especially valuable for use in communication apparatus.

The heat treatment of Permalloy is very important and greatly affects its magnetic properties. Its very exaggerated inter-relations between permeability, conductivity and mechanical stresses make it a great asset to the physicist in his research work, and with greater perfection it may find wide application in the electrical field.

—Carnegie Technical Journal.



## The Junior Prom

With spring at hand, our thoughts turn to the greatest social affair of the year at Rose. Under the spell of the finest orchestra in the country, with decorations approaching perfection, with every detail taken care of, who wants to miss the Junior Prom? This year's affair is going to be above any thing that has ever been given at Rose. Profiting by mistakes made last year, the committee promises a wonderful evening to everyone. Along with the policy of improvement, the committee has decided that, in view of the fact that a considerable sum is to be saved this year through careful expenditures, they can cut down greatly the number of invitations issued to those outside of the school. We want, as far as possible, only close friends of Rose. Those fellows who have friends whom they would like to see at the Prom should get in touch with a member of the committee immediately.

The orchestra is the biggest attraction. Benson's Recording Orchestra, directed by Don Bestor, is known from coast to coast. The organization consists of eleven of the finest dance musicians now playing. The orchestra has been entirely changed since last year's Prom date, only two or three of the former musicians being still connected with the organization. Benson stands for the last word in dance music. "You have heard the rest, now hear the best."

A word about finances is, perhaps, not out of the way. The committee needs money and lots of it. More, they need it before the date of the Prom. The easiest way for all of us is to pay a little at a time as we have it. Tickets, so arranged that payments may be easily recorded, may be had from members of the committee.

Don't forget the date—May 15. The price is five dollars for Rose men and Alumni, and six dollars for those not connected with the school.

---

W. Lang Bass, one of the students at Bradley Tech., has designed a new clock model, and made and assembled all the parts. All the work on the model, with the exception of the main spring and the hold jewels, was done by hand. Mr. Bass figured all dimensions and ratios of the wheels to the pinions. The cutters, and every screw and wheel, were turned out by hand. The clock lost but thirty seconds in one week.

The "Brown and White" of Lehigh has a statistical genius on its staff, who has doped out how much the clothes at the Harvard-Princeton football game were worth. He estimates the average cost of clothes per person around \$500, as every second man wore a raccoon coat, and practically every woman wore furs, ranging from raccoon jackets to sable coats. Based on a minimum attendance of 60,000 persons, the total cost of clothing worn by the crowd is conservatively estimated at twenty-five million dollars.

Correspondence courses in radio reception and transmission are offered by the engineering departments at Penn State College. More students have enrolled in the radio courses than in any other correspondence course.

## Heard About School

The Freshman Class has lost two of its members recently. Pinson has left school to attend Indiana State Normal and Bennett has dropped out of the class because of sickness. Now that mid-terms are over, the class is still smaller.

Spring football practice went over with a bang. Hez was very well pleased with the bunch and hopes to beat Indiana this year. While speaking of the Indiana game, here is John Morehead's story. He says there is no reason why we can't beat them if the whole squad will come back in condition and ready to start work about the first of September. Then with Indiana beaten, the team will have the confidence and enthusiasm to go through the season and beat Purdue later.

The applications for scholarships must be in by the first of May, so all you students put in your bids. But don't forget to get good marks also. It has been said that that is a necessary qualification.

St. Pat is a wonderful old fellow. His spirit of brotherliness was noticed in the shops while the floats were being made. If you noticed it, you could have seen Sato, Feldstein and Bradford all working together. Yes, St. Pat is a great man.

Mr. Everett Gosnell of West Terre Haute, is quoted as having said that the present is a very trying time. Mr. Gosnell, it is alleged, is trying to inaugurate a new style in haircuts and is finding it a very difficult undertaking. It is said that Mr. Gosnell, who is of a decidedly eleemosynary nature, is taking pity on a certain West Terre Haute barber who is an amateur in the trade and has not yet become sufficiently proficient to cut hair in a civilized fashion. Hence the new coiffure for men.

It is further alleged that Mr. Gosnell is contemplating the cultivation of a set of bangs which, however, may turn out to be spit-curls instead.

A. T. Childs (lecturing to the Senior chemists, only a small percentage of whom are completely conscious): "Of course, we are both aware of these conditions as they exist today."

Much speculation has been going around lately as to the whereabouts of Beppo Skeeters. One used to be able to find him every night at the billiard hall but he is never seen frequenting those places of infamy any more. The answer is this: He's become a home man. Yes, he likes to stay at home now and study—no not study but just stay at home. She's really a nice girl.

Bill Waltman and Leon Maehling have just completed their 1000th game of checkers and they say that they hope to complete their second thousand within the course of another month. These two veterans have borne up under the worry and strain of the game remarkably well and they show scarcely any evidence of the severe physical strain they have undergone in the course of their games.



## IS THE SPECTROSCOPE A DETECTIVE?

That American industry is making use of the spectrum as a detective is the statement made recently by the Bureau of Standards. Increasing numbers of industries engaged in the manufacture of metal products are finding a valuable aide in the method of spectral analysis of metals which they use, and which has been developed to its present state by the spectroscopy section of the Bureau. This system offers a more convenient and rapid means of detecting impurities in metals than chemical methods. Two big New England firms, one engaged in brass and bronze manufacture and the other in silver, are making constant use of a spectrograph, a device which makes this detection of various chemical elements a simple procedure.

Scientists of another generation, who had knowledge of the spectra of various elements, found themselves handicapped in applying that knowledge. Except for a small group, they left the development of spectroscopy to physicists and astronomers. Working in this field, the latter were able to discover helium. Increasing knowledge in the fields of electricity and photography, however, was brought to the aid of the scientists who clung to their belief that spectral analysis of materials could be perfected. And the patient persistence of this group has been rewarded.

It was while the Bureau of Standards was engaged in researches in this science that a problem came up. A steamship had been lost by a boiler explosion. In such boilers there had been placed a safety plug which was supposed to melt at certain temperatures forming one of the conditions preceding such an explosive point. The "safety plug" had apparently failed. "Why?" the Bureau was asked.

The spectrograph revealed that plugs which were supposed to be of pure tin, contained a trace of lead, zinc, and other metals in some cases. Pure tin melts at a temperature of 232 degrees, Centigrade. The presence of lead or zinc or other impurities caused the formation of a compound which required a very high temperature for melting. The reason was clear. Thus the spectrum analysis had been applied in a rapid and convenient manner, and an optical method had supplanted a more complicated chemical test. The Bureau then developed specifications and methods of test to eliminate further accidents from this source.

In the case of a high pressure valve made in a mid-western city, leaks were discovered. Again the Bureau of Standards was asked "Why?" The Bureau took some of the material used and the spectrograph revealed the presence of aluminium in the alloy—in a degree unfavorable to high pressure work.

Not very long ago the spectrographic method revealed its accuracy in "checking up" the Bureau of Standards itself. Standard samples of vanadium steel had been prepared and sent to various points. Word began to come back to the effect that these "standards" showed traces of tin. At once an exhaustive check-up was begun. The operations were carried on to the point of boiling down some of the

## FRATERNITY NOTES

### A. T. O.

Gamma Gamma chapter announces the pledging of the following Freshmen:—Hugh V. Alexander, of Louisville, Kentucky; Edwin S. Booth of Marshall, Illinois; Richard D. Cole, of Marshall, Illinois; Fred A. Curl of Paris, Illinois; Norman Neeley, Theron S. S. Bell, Fred J. Franzwa, Morris W. Kintz and J. E. Unison of Terre Haute.

The chapter entertained with a dance in honor of its pledges on Friday evening, March 28, at the chapter house on South Fifth street. Music was furnished by "Scotty's" five piece orchestra, and this annual affair, as usual, proved a great success. Harold Pitser and George Beebe of Indiana University were also guests of the chapter. Doctor and Mrs. White were honor guests of the evening.

"Rough week" is over, much to the satisfaction of the Freshmen, and Hugh Alexander, Edwin Booth, Theron Bell, and Richard Cole having been initiated, are proudly wearing the insignia of A. T. O.

Practically all of the brothers are preparing to attend the Alpha Tau Omega state dance and banquet at Indianapolis on April 18 and 19. Rose was well represented last year and will be again this year.

Many of the Alumni returned for the St. Pat's celebration including, Rex Self, Carl Froeb, Ronald Manson, Jimmy King and Malcolm Scott. Brother Armstrong of Illinois University visited the chapter recently.

### SIGMA NU

Beta Upsilon is busy making plans for the District Convention to be held here April 10 and 11, at which time delegates from Indiana, Purdue, Kentucky State and Depauw will be entertained.

A formal dance is to be held at the Deming on Friday evening of April 11.

Brother Hirschell Hearn was a guest of the chapter last week. Brother Hearn is employed by the Wagner Electric Company.

chemical reagents used in preparation of the samples. A tiny scrap of residue was found, not larger than the head of a pin, too small for chemical analysis. Use of the spectrograph disclosed the fact that there were eleven chemical elements in this tiny speck, and that the most prominent was tin.

In preparing purity standards of platinum, rhodium, iridium and palladium, the spectrograph has again been used with success, and it is declared that the chemical knowledge of these unusual metals is as yet so unsatisfactory that this method is the only safe one to use.

## PROGRESS IN THE USE OF RADIO SIGNALS IN NAVIGATION

ON August 24 a new light vessel, with a radio fog signal, was placed on Nantucket Shoals station. This is the eighth radio fog signal put into commission by the Lighthouse Service of the Department of Commerce, the others being Fire Island, N. Y., Ambrose Channel, N. Y., Sea Girt, N. J., Cape Henry, Va., Diamond Shoal, N. C., Blunts Reef, Calif., and San Francisco, Calif., all but two being on light vessels. Five more stations are being established, all on light vessels: Boston, Mass., Five Fathom Bank, Del. (off Delaware Bay), Cape Charles, Va., Swiftsure, Wash. (off the Straits of Fuca), and Columbia River, Ore.

While more such stations have been established here than in any other country, progress is being made throughout the world. France has established such signals at Gris-Nez, Creach, Sein, and Le Havre; Norway has installed two signals in the approaches to Bergen and Kristiana; Spain has in operation signals at Finisterre and Villano; Holland is placing a radio fog signal on the new lightship for the approaches to Rotterdam. In Scotland a rotating radio beacon is in experimental service at Inchkeith, and a similar station will soon be installed on the English coast. At the International Navigation Congress, held in London in July, the foremost topic of interest to the lighthouse representatives was the development of radio fog signals.

All of the above-mentioned stations, with the exception of two rotating beacons, are designed for use by means mounted on shipboard. In this system of navigation the navigator of the ship or his radio operator at any time desired takes a radio bearing of any radio beacon or other wireless station which is operating within range and whose location is shown on the chart; or a radio bearing of any other ship within range, which is operating its radio, for the purpose of passing safely an approaching vessel, or for locating a vessel requiring assistance, or for any other purpose. The opinion was unanimous among those consulted abroad and in the statement at the Navigation Congress that the most valuable application of radio direction finding in navigation will probably be through the use of means provided on shipboard to enable the navigator to ascertain the direction of radio signals; this is the general solution of the problem, valuable to a vessel wherever it is, and also having the great advantage of retaining on the ship the responsibility for locating the vessel. The other systems of direction finding from shore and of revolving beacons undoubtedly have valuable uses, but the first would be of prohibitive cost to governments to extend throughout the world, even if a liberal charge were made for each bearing furnished, and the second is not applicable to any floating aid. Referring to radio direction finding the chief engineer of Trinity House (English lighthouse service), general reporter at the Navigation Congress, stated in his "Conclusions" that it appeared to him "that a system applicable to stations both ashore and afloat which employ a wireless beam whose direction is ascertained by the navigator himself is the primary basis for such

investigation and development." The French lighthouse report to the Navigation Congress said: "As to Hertzian signals, the method of the radiogoniometer on board is the most logical and most general."

The installation of radio compasses or direction finders on shipboard has of late been making much progress. Direction finders are installed, or are now being installed, on about 100 foreign vessels, including those of the White Star Line, Red Star Line, Royal Mail, Peninsular and Orient, Canadian Pacific, Norwegian American Line, the Bergen Line; included in these are many of the large trans-Atlantic steamers. They are installed on a number of vessels on the Pacific coast, including the President McKinley and the H. F. Alexander, the largest coastwise vessel on that coast; the Standard Oil Co., after test with one vessel, is equipping 12 large oil tankers; of United States Government vessels, 5 tenders of the Lighthouse Service, and several Coast Guard cutters now have radio direction finders. Reports indicate that the direction finders are in active use on the above vessels, and that a large percentage of the bearings taken are correct within two degrees, thus showing that this method of navigation is placing at the disposal of navigators a means of taking bearings in fog of a degree of accuracy approaching that possible with visible marks, and available at greater distances. The following comments have recently been made: The captain of the steamer Belgenland states "I have found the 'automatic transmitter' on Fire Island a most wonderful aid to navigation"; the captain of the H. F. Alexander reports "Too much can not be said of the good results of the radio compass."

There are two principal types of radio compasses or direction finders in successful use on ships, the rotatable loop type, and the fixed antenna type. The former, in more general use in this country, employs a large rotatable loop aerial, and the latter, in use abroad, uses two fixed loop aerials, one transverse and one parallel to the ship's axis, and a small rotatable coil in the receiver, the bearing in either case being taken by rotating the loop or coil until a minimum signal is obtained. With the former type the radio coil has in some cases been mounted directly over a magnetic compass, permitting direct magnetic readings to be taken. Recently on the steamer President McKinley the coil has been placed over a gyroscope compass repeater, thus giving true bearings directly. Companies both in the United States and abroad are now regularly supplying direction finders for installation on ships.

Aside from its direct navigational use, in locating the vessel, in approaching a leading mark, and in avoiding collisions, its great value in rescue work at sea is shown by numerous instances, a number of which have been given in this bulletin. There are other possibilities in its use, as for instance in clear weather for navigation by bearings when beyond the range of visible objects; it is already being utilized for this purpose in coastwise navigation off the Pacific coast.

The radio fog signal for Five Fathom Bank Light Vessel, now under construction, will be provided with



a tube transmitter operating with continuous wave, instead of the spark transmitting set heretofore used. It is expected thus to obtain sharper and stronger signals, and eliminate interference.

### Better Protection for Nantucket Shoals

The Secretary of Commerce announces that on August 24, 1923, the Lighthouse Service placed a new light vessel on Nantucket Shoals. This is probably the most important lightship station in the world, as it is a mark steered for by nearly all trans-Atlantic vessels; it is also one of the most exposed stations, as the vessel is anchored 41 miles from land, in the open Atlantic south of the great area of shoals which it guards.

The new vessel was specially designed and equipped for this station, one of the most severe duties to which a ship can be subjected.

It will have for the first time a radio fog signal, an automatic apparatus sending during fog a group of 4 dashes every 30 seconds, enabling vessels with radio direction finders to obtain an accurate bearing from a distance of 30 miles or more in any weather conditions, and to steer for and "make" the lightship, most important for the safety of shipping approaching the American coast. The light vessel will also have two other fog signals, a powerful steam whistle, and a submarine bell; a little later a submarine oscillator, a more powerful electrically operated signal, will be substituted for the bell. The electric signal light of 3,000 candlepower will show at the masthead 4 occultations a minute. There is radio equipment for communication, with a radio operator in attendance, valuable for reporting vessels in distress, as well as for the maintenance of the light vessel itself.

The vessel has oil fuel, and water tanks of sufficient capacity to remain on station for one year, thus eliminating the difficulty and expense of coaling a lightship. For safety and to enable it to return to the station, the vessel is provided with propelling power, consisting of a 235 horsepower compound steam engine, with two Scotch boilers and necessary auxiliaries, and also is fitted with electric lights, refrigerating plant, and suitable quarters for officers and crew. It is a small craft considering its exposed station, being 132 feet long, and 775 tons displacement. It is anchored in 30 fathoms of water, but is moored with a scope of 120 fathoms of chain.

The maritime world will be interested to learn of the new light vessel, and its equipment with the radio fog signal, which a trans-Atlantic captain recently wrote is "a most wonderful aid to navigation."

### The Radio Direction Finder at Sea.

(Translated from Radioelectricite, July 15, 1923.)

Particularly interesting trials of the radio direction finder have just been made on board the hospital ship Sainte-Jeanne-d'Arc, whose continuous services are keenly appreciated by our mariners. In order to establish the accuracy of the bearings taken by the aid of the radio direction finder on shipboard, numerous and careful measurements were made during the recent voyage of this boat from France to Newfound-

land. The signals from Ouessant were heard 1,000 miles from the station, and those from Land's End 700 miles away. It was found that the course set by means of radio bearings coincided exactly with the course set by astronomical calculations.

The chief of the radio telegraph station of the Sainte-Jeanne-d'Arc, M. Monrouzeau, sent us the official text of his report.

At the time of landing at Cape Race, there was a thick fog. The position of the ship could only be estimated. Having taken the bearings of the station at Cape Race about 150 to 160 miles away, we altered our course to bring this bearing to zero degrees and followed this course for about 20 hours, always maintaining the bearings at 0°. Following this course we came up to the fog horn of Cape Race (which is installed in the wireless station) exactly in front of us, at a distance of 7 to 8 miles. From this point we circled Newfoundland and followed the south coast, guiding ourselves with the simultaneous bearing of VCE and FIT.

Nearing Saint-Pierre, where we frequently test, the direction finder bearings located us on Lameline and this position was found exactly right by a test. The fog was thicker and night was falling.

We headed toward the Ile Verte by setting a course so that FIT was at S, 55° east, which course kept us from danger. Following this course we finally arrived at the expected point given by the bearings. A few hours later, after the fog had let up, we saw that we had anchored in the proper place 500 meters from the land.

During this trip the minimum point of the signal from FIT had been very sharp and it was not necessary to take several bearings.

On the trip from Sainte-Pierre to North Sydney (Cape Breton Island) we saw land which the navigators refused to recognize as such, since it appeared hazy like a mirage and a veil of light fog. We concluded that land must be near from our location obtained by means of several bearings on Sable Island, North Sydney, Canso, Grindstone Island, Saint-Pierre. These bearings crossed within a fraction of a mile due to the swing of the ship while bearings were being taken. We used these bearings in navigation and found later that they were correct.

The above indicates most clearly the great advantage of the direction finder on shipboard.

The observations of M. Monrouzeau show without doubt that the radio direction finder is a reliable nautical instrument. In time of fog when one is unable to make the ordinary astronomical observations, and the fog horn does not carry well and can not be depended upon to give accurate locations, the direction finder on shipboard remains the only recourse to the navigator, indicating at all times and all places the correct course which the navigator should follow.

## BILL CHANGES GIRLS AGAIN

Dere Pete:—

Well, ole sock, I lived thru mid-terms but the less I go into detail about them exams, the better chance this letter will have of getting past the editor's blue pencil.—Pete those mid-terms was a synonym to Sherman's nick name for war.—I kept my head above water until Analytics hove in sight but after I read the problems I collapsed into a state of blissful unconsciousness; and later when I was revived they said my first words were "Did they get the license number of that truck?" Pedro, there is a proverb what says "It never rains but what you've left your rubbers at home" or something like that. It was bad enough to flivver on the exams but—most Hon. Hades—Carmelita has gave me the air! Dernit, a Freshman is S. O. L. when a Junior starts cutting his time and that's what happened to me. When Nick Lakewood started dating Carmelita on my "off" nights, Omigosh, right when I thought I was the alligator's wading boots I finds out that I'm about as welcome as a carpet tack on a swivel chair. Oh well! I ain't the only one what is got the gate from a fickle flapper. Terry Mohan, "Ik Mik Oik", Freshman, etc., has been going steady with a young Wileyite for quite a spell, but this little hot rock is as stubborn as Bryan on the evolution question. Seeing as how Terry can think up some zippy answers, it isn't very long until they gets into a nice jawing party and busts off sentimental relations. A day or two later Terry and me was philosophizing on the weaker(?) sex in general, after which we arrove at the conclusion that all women over 4 and under 90 are fickle. So you see Pete, we was rarin' for new fields of activity.

After supper that night Terry and I nose the old bus up in the general vicinity of downtown, where we had been put hep that the Purple Polygon Club was slinging a indoor piracy-picnic—i. e. a carnival. This here Purple Polygon Club is a flapperese organization embracing several brands of feminine activity, carnivals being one of their methods of wresting stray yen from jazz addicts like Terry and me.

As the evening progressed and the mean mammas began to unhandle various welcome signs to the masculine date-chasers, I points over to a little group amongst which is the erstwhile "my" Carmelita, and says to Terry, "Whoza brace o' kids standing next to my ex-flame?" Terry slants over to where I indicates and sez, "The blonde haired job is Florence Wade; the brown haired kid in the wooly sweater is your fair Carmelita's cousin Lois; whadaye rate 'em?" "Ace-high, Terry me boy, and remember, that we is looking for company." In the general course of a few minutes I have been given a knock-down to Lois; danced with her and have asked to haul her home. She harks as how Florence is going home with her to share her hay and that she cant date unless Florence does. Right there Terry snares Father Time by his spit-curl when he comes up and gurgles to the extent that he and Florence will endeavor to make a double date a reality.

We goes out and presently we are winding the wheels "muy pronto" out north Seventh—far out beyond the nut-munching squirrels of Collett Park. I looks back over my shoulder to ask Terry a question but Terry was in no way to be interrupted. I'm no good at describing things super-sentimental but Terry was staging a scene that would have made one of Rudy Valentino's final clinches look like Zybysko and Strangler Lewis. Pete, you well know that I hates to be outdone in any kind of activity, whether it be Nature study or athletics, so it werent many minutes until my handsome(?) Rand-McNally was ever and anon engaged in a few osculatory exercises—which, needless to remark, gave an added zest to the already colorful and torrid atmosphere. Far be it from yours sentimental to paint any obscure word-picture or to foster any excess imagination on the part of the gentle reader, but nevertheless I desire to affirm that this woman Lois is just like a well-known make of furnace—"She makes warm friends."

After a few miles of aimless(?) wandering we disembarks at Lois's apartment, from whence Terry and I departs some 63 and five tenths minutes later. Terry, being of an acquisitive nature, absent-mindedly allows a silver bar pin from Flo's hat and a photo of Lois off'n the piano, to depart with him. I reprimands him most severely and confiscates the photograph for my personal usage.

No doubt you've heard that gag about "In the spring a young man's fancy—etc."—Well, Pete,—the spring fever bug bites Terry and me most terrifically so in a very few days our scholastic efforts jumped from no-place to a standstill. We was in the Hon. Prof. Stock's very-free hand drawing class one afternoon when I nose over to Terry's parking place and makes remarks as how a "hike" to the virgin forests on the following Sunday would be quite copacetic.

Upon further consultation, all parties concerned, meaning Nick, Carmelita and our duet of flappers, arrove at the conclusion that the following Sunday we would hie ourselves forth to the forests primeval, to the north of Seelyville, U. S. A. So on a most glorious A. M. at seven bells we departs from Lois' domicile laden with ample quantities of chow and other equipment necessary and proper to any self respecting hike, and after so many hours of this unaccustomed hoof-exercise we arrives at a "sequestered spot" in the great out doors. I spent about an hour looking for the great doors but failed to find any trace of 'em.

We finally got the feed-bags hung on, and believe you me I sure draped myself around a huge amt. of noble-nutrimint. Carmelita do make rare chicken sandwiches—I know they was chicken 'cause I found a Plymouth-rock feather in one of 'em. Florence tried to wish a Swiss-cheese sandwich onto me but—shades of the Commercial Solvents Co.—the nicest thing about Swiss-cheese is the holes therein. Due to some coincidence Terry and I simultaneously decided to go "frog-hunting" but we couldn't find any frogs so we brought back a green hop-toad and told

(Continued on Page 16)



## HERE AND THERE

Sigma: "You're drunk, lemme drive."

Pi: "Awri!"

Crash! A fire plug and two telephone poles smeared.

Pi: "Ha! Ha! Fooled ya, didn't I? Didn't unlock the steerin' wheel."

—Rensselaer Poly.

### THAT REMINDS ME

The other day, I went to call on a friend, and found his dog—a large, woolly beast—sitting in the middle of the room, howling. I asked my friend why his dog was howling so miserably. He replied that he was howling because he was a lazy dog.

"But why should a lazy dog howl?"

"Because he is sitting on a thistle, and he is too lazy to get up."

—Harvard Lampoon.

### A TRITE LESSON (Apologies to Riley)

There, little girl, don't cry;  
They have broken your flask, I know,  
And your cellar, too,  
Has an empty view  
As compared to the long ago.  
But your bootlegger friend will soon pass by,  
There, little girl, don't cry.

There, little girl, don't cry;  
You have flunked your exam's, I know  
And the care free ways  
Of your high school days  
Are things of the long ago.  
But time will sooth your hopeless sigh.  
There, little girl, don't cry.

There, little girl, don't cry;  
Your Romeo's gone, I know,  
And you're feeling blue  
And lonesome too  
For the days of long ago.  
But another sheik will soon stop by.  
There, little girl, don't cry.

—From the "Bison."

## Craft's Book Store

673 Wabash Ave.

Golf or Tennis Supplies—to please You

Base Ball Supplies in great profusion

Magazines and Fiction

## GRAND THEATRE

BE SURE AND SEE

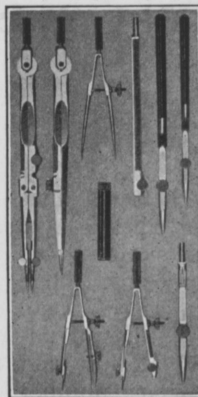
## The Tiger Rose

With the Famos Miss Ulrici

April 20th to 25th

Continuos 1 - 11

No Advance in Prices



Set No. 2066  
In Case, \$34.50

## Appreciated the World Over for Their Excellence

Every genuine Alteneder Instrument is stamped "T. A.," "T. A. & Sons," or "T. A. Alteneder & Sons."



Catalogue on Request

**THEO. ALTENEDER & SONS**  
1217 Spring Garden St., Phila.

## Would you like a Young Men's Latest English Model Suit The London Sack

Cost no more than ready made.

Quality and Fit Guaranteed

—O—

Try Us - We Will Show You

## The House of Foulkes Bros.

Hats - Haberdashers - Clothiers

EVERY engineer should know APOLLO Best Bloom and Apollo-Keystone Galvanized Sheets, American Bessemer and Open Hearth Steel Sheets; and KEYSTONE Copper Steel  
*Rust-resisting Black and Galvanized*

## SHEETS

We manufacture SHEET AND TIN MILL PRODUCTS for all purposes—Black Sheets, Galvanized Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Galvanized Tank, Culvert and Flume Stock, Special Sheets for stamping, Stove and Range Sheets, Automobile Sheets, Electrical Sheets, Roofing Tin Plates, Bright Tin Plates, Black Plate, Etc. Sold by leading metal merchants. KEYSTONE quality is of particular interest to you. Send for booklet.

AMERICAN SHEET AND TIN PLATE COMPANY, Frick Bldg., Pittsburgh, Pa.



All Matters Relating to  
Patents and Trade Marks

**HOOD and HAHN**

Arthur M. Hood  
Rose '93

1001 Hume-Mansur Building  
INDIANAPOLIS, INDIANA

**BRUNSWICK**  
PHONOGRAPHS AND RECORDS

All the Latest Hits  
SAXOPHONE AND BAND INSTRUMENTS  
C. G. CONN MAKE

*The*  
**Brunswick**  
**SHOP**

JENSEN BROS.

527 Wabash Ave

**The Best Clothes**

**Cost the Least**

**Stein-  
Block  
Sam-  
peck**

The best is the cheapest in the weeks of wear for then the test comes. The clothes we sell you are made from the finest materials and by the most capable tailors that can be found in all America. The fit and the style cannot be excelled. The prices at Myers Brothers are as low as good merchandise can EVER be sold for. On this basis your patronage is solicited.

**Myers Brothers**

Fourth and Wabash

**SPRING SUITS**

That you'll like

**Society Brand**

**\$45.00 to \$60.00**

**Styleplus**

**\$25.00 to \$45.00**

**JOSEPH'S**

Get Your Hair Cut at

**KRAMER'S BARBER  
SHOP**

28 SO. 7TH

SANITARY THRU AND THRU

**MAX FRANK**

"THE SOLE SAVER"

FIRST CLASS SHOE  
REPAIRING

7TH & CHERRY Phone Wabash 1995

**The Latest  
English Models**  
**Copley - Royal Park**  
**Universal Jr.**  
*Fashion Park Suits*  
**Spring 1924**

**Look Them Over Boys**

**Tan Slicker Rain Coats**  
Students Special - - - **\$6.50**

**Lee Goodman & Son**  
410 Wabash Ave.

**Bill Changes Girls Again**

(Continued from page 13)

'em it was a frog of the genus "Batrachia". Lois longingly remarked that she just adored frogs legs and insisted that we cook the nether pins of this land-going amphibian. Rather than incur the wrath of the most fair Lois, I skinned the critter and removed the aforementioned toothsome pedal extremities. But the Fates showed rare wisdom, for just as Nick got the fire going good I accidentally dropped the choice pieces of energy builder in the roaring flames—much to the chagrin of Lois and much to the relief of myself.

We took the customary number of pictures among which was one of me sitting with a farmer's collie dog nearby. As Lois peered into the finder she muttered, "vicious looking brute."—I was insulted and to this day I don't know which one of us she referred to.

Well Pete, I should worry—Lois gleefully consented to go to the Junior Prom with me, next month—so I'll tell you more about that next time. Yea verily! truth is wilder than fiction.

Yours,

BILL.

Thanx to narrative of C. M. S.

# Rose Polytechnic Institute

Founded by Chauncey Rose at Terre Haute, Indiana, 1874

## A College of Engineering

OFFERS A SCIENTIFIC EDUCATION, BASED ON MATHEMATICS, MODERN  
LANGUAGES, PHYSICAL SCIENCES AND DRAWING, WITH THOROUGH  
INSTRUCTIONS IN THE PRINCIPLES AND PRACTICES

**Mechanical, Electrical, Civil, Architectural and  
Chemical Engineering**



## GOOD LIGHTING OF INDUSTRIAL PLANTS SECURES SAFETY AND EFFICIENCY.

The Code of Lighting for factories, mills and other work places of the State of New Jersey makes excellent recommendations of daylight for the proper lighting of industrial buildings.

Adequate daylight facilities through large window areas, together with light, cheerful surroundings, are highly desirable and necessary features in every work place, and they should be supplied through the necessary channels, not only from the humane standpoint, but also from the viewpoint of maximum plant efficiency.

### Importance of Daylight.

The unusual attention to gas and electric lighting in factories, mills and other work places during the past few years; the perfection of various lamps and auxiliaries, by means of which an improved quality and quantity of lighting effects are obtained; and the care which has been devoted to increasing the efficiency in various industrial apparatus—all go to emphasize the many advantages and economies that result from vital and adequate window space, as a means for daylight in the proper quantities, and in the right direction during those portions of the day when it is available.

### Three Considerations.

Three important considerations of any lighting method are sufficiency, continuity and diffusion, with respect to the daylight illumination of interiors. Sufficiency demands adequate window area; continuity requires (a) large enough window area for use on reasonably dark days, (b) means for reducing the illumination when excessive, due to direct sunshine, and supplementing lighting equipment for use on particularly dark days, and especially towards the close of winter days, (c) diffusion demands interior decorations that are as light in color as practicable for ceilings and upper portions of walls, and of a dull or matt finish, in order that the light which enters the windows or that which is produced by lamps may not be absorbed and lost on the first object that it strikes; but that it may be returned by reflection and thus be used over and over again.

Diffusion also requires that the various sources of light, whether windows, skylights or lamps, be well distributed about the space to be lighted. Light colored surroundings as here suggested result in marked economy, but their main object is perhaps not so much economy as to obtain results that will be satisfactory to the human eye.

### Requirements for natural lighting:

1. The light should be adequate for each employee.
2. The windows should be so spaced and located that daylight is fairly uniform over the working area.
3. The intensities of daylight should be such that artificial light will be required only during those portions of the day when it would naturally be considered necessary.
4. The windows should provide a quality of daylight which will avoid a glare, due to the sun's rays, and light from the sky shining directly into the eye, or where this does not prove to be the case at all parts of the day, window shades or other means should be available to make this end possible.

As will be noticed in the above recommendations, large windows and proper diffusion of daylight are urged, in order to meet the demands of daylight lighting.

Shades may be eliminated and most efficient lighting obtained by the use of Factrolite Glass.

If interested in the distribution of light through Factrolite, we will send you a copy of Laboratory Report—"Factrolited."

MISSISSIPPI WIRE GLASS CO.,

220 Fifth Avenue,

St. Louis.

New York.

Chicago.

## BROWN & SHARPE MACHINES

*You Should Become  
Familiar With Them*

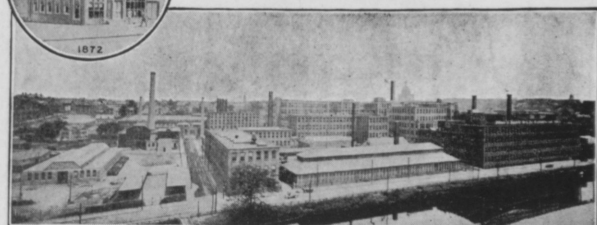
Milling Machines  
Grinding Machines  
Gear Cutting Machines  
Screw Machines

Knowledge of our line of manufacture will surely be of use to you in years to come—for Brown & Sharpe Machines are used in a great many industries. In the small repair shop or in the largest high production manufacturing plant, these machines are being used to do many classes of work. The small shop likes their versatility and ability to stand up under that extraordinary job which often loads the machine beyond its rated capacity. The big plant finds they give production and a product uniformly accurate. Brown & Sharpe Machines are ruggedly constructed and will maintain their accuracy for many years. Investigate their many uses.



Ask your Librarian to show you the Brown & Sharpe books—Catalogue studies—Nos. 29, 29x and 29xx. Our Catalogue No. 137 gives details about our entire line of manufacture.

**BROWN & SHARPE MFG. CO.**  
Providence, R. I., U. S. A.



ED. S. LAMMERS

RONALD LAMMERS

IF IT IS PAINT OR GLASS  
WE HAVE IT

**ED. S. LAMMERS & CO.**

13th and Wabash

Phone Wabash 5124

**NEW OXFORDS**

For

**Spring are Here**

All the New Models  
and New Shades in Leather

**\$6 to \$8****CLATFELTERS**

826 Wabash Ave.

Put your feet  
into  
"Walk-Overs"

Every pair of Walk-Over Shoes  
is built over lines as exacting  
as were ever worked out by an  
Engineer. In each pair the ex-  
perience of more than 50 years  
finds expression through the  
best materials that can be  
obtained.

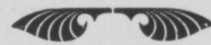
They are positively the best  
that can be made—and they  
sell reasonably, too,—

**\$7.50 Up**

CHENEYS

**WALK-OVER BOOT SHOP**

651 Wabash Ave.

**New Spring Styles**

in Hart Schaffner &amp; Marx Fine

Clothes now ready

Also a big showing in Men's  
Hats, Shoes, Shirts, Underwear  
and Men's fine Furnishings.

**TUNE BROS.**

5th and Wabash

For Easter Send

*Mewhinney's*  
TERRE HAUTE, INDIANA

**CHOCOLATES**

Cordial Cherries or Superbas

None Better Than *Mewhinney's*

When you think of  
**FLOWERS**

think of

**HEINL'S**

129 So. Seventh Street  
TERRE HAUTE, INDIANA



**Artistry and Devotion in Salesmanship**

(Continued from page 6)

far as special mental functions or aptitude are concerned, if only we have wills strong enough to take the trouble." I advise all my readers, especially young men, to read, study and practice the "Education of the Will", as outlined by Jules Payot (Funk & Wagnalls, Publishers). Most salesmen fail after qualifying in all other respects, because they inadequately consider the synthesis feature in their sales talks. This feature embraces the following:

Summing up of salient points.

Drawing conclusions.

Assisting the prospect to decide through powerful suggestion.

Many good sales talks are ineffective even when uniformly sustained throughout the interview, because they lack the cumulative feature; they should grow stronger as they proceed, and conclude strong by earnest summing up.

Theaters are packed at \$1.50 to \$5.00 an auditor to see and hear a great actor. Suppose instead of inflicting the usual sales talk of the average salesman upon the indulgent buyer, the latter had to pay the price of \$10.00 an interview for the privilege of enjoying and benefiting from the sales demonstration of the average salesman. How many salesmen would ever get a second interview with the same prospect? How many would merge the alpha and omega of their sales performance into one brief experience, and among those who survived, what a great improvement over present methods would be demanded and acquired!

Sales talks should be written out, even if not memorized. The muscular and nervous activities, "hand and speech are physiologically connected." Nothing so stimulates thought and constructive imagination as the habit of writing; it aids accuracy, stimulates the association of ideas, and develops expression. But few of us make an effort to think and to think our best, and until we do the best of us is dormant, because as Hamilton says, "The largest part of our mental riches are hidden away in the obscure recesses of the mind."

This article is intended to be more suggestive than exhaustive, and somewhat constructive in criticism, and I shall therefore close it with another encouraging quotation from Wm. Hanna Thompson's, "Brain and Personality":

"Personality is modified mind stuff or original substance which constitutes the basis of individuality, acted upon and moulded into form by all-contributing will. We can fashion ourselves after the order of our thinking by applying the energies at our command, or we can just let ourselves become what we may be under the control of unmodified environment."

WM. C. McGUIRE

WILBUR B. SHOOK  
Rose "1911"**McGuire & Shook**  
**Architects and Engineers**320-21-22 Indiana Pythian Building  
INDIANAPOLIS**The New**  
**English**  
**Model Suits**

In Powder Blue, Dull Gray,

**MODERATELY PRICED**

Two Trouser Suits

**\$28.50 to \$45.00**Topcoats **\$25.00** upGolf Suits, Hose, Knickers  
Sweaters, Shirts.*Satisfaction Guaranteed or Money Refunded***Harry Schloss**  
666 WABASH AVE.**Freitag-Weinhardt & Co.**Opposite Hotel Deming  
30-32 North 6th St.**for Electric Hardware Supplies**  
**PLUMBING and HEATING**

PHONE WABASH 140



## Radio Fog Signals and Their Use

(Continued from page 5)

The above discussion considers the behavior of the radio direction finder from the point of view of the magnetic field. Radio waves are also accompanied by a field of electric force which is vertical and at right angles to the direction in which the wave is traveling. The behavior of the direction finder may also be considered from the point of view of the field of electric force. This latter method involves the phase angle between the two vertical sides of the coil. When the plane of the coil is perpendicular to the direction in which the wave is traveling, the crest of a wave reaches both sides of the coil at exactly the same instant, and the voltage induced in the two vertical sides are exactly equal and oppose each other so that no current flows in the coil circuit. When the coil is turned in any other direction, at the instant when a wave crest reaches one vertical side of the coil, the crest has not yet reached or has already passed the other vertical side of the coil, so that the voltages induced in the two sides are not exactly equal and do not just neutralize each other.

Either mode of considering the behavior of the direction finder is correct, but the one described first, involving the magnetic force, is somewhat more convenient and furnishes a better physical picture.

When the coil is turned in the direction in which the radio wave is traveling, the following is a proportional expression for the received current in a coil antenna:

$$I \text{ is proportional to } \frac{h l N H}{R w}$$

where

**h** is the height (length of the vertical side) of the receiving coil aerial or direction finder.

**l** is the length (horizontal side) of the receiving coil aerial.

(Therefore, **hl** is the area of the coil.)

**N** is the number of turns of the coil.

**H** is the field produced by the transmitting station at the point where the direction finding coil is located.

**R** is the resistance of the circuit of the receiving coil aerial.

**w** is the wave length of the transmitted wave.

The small dimensions of the coil render its installation practicable on shipboard, but they result in a system of extremely low efficiency, so that to make a workable instrument, very great amplification is necessary. The vacuum tube multistage amplifier is therefore essential to the employment of such small coils for radio compass purposes, and its introduction was an important step in making the instrument usable for this purpose.

### Future Development

The Lighthouse Service proposes, as means are available and needs are developed, to install similar groups or single radio fog-signal stations in the vicinity of important entrances on the Atlantic and Pacific coasts of the country and on the Great Lakes, as well as on some of the principal intermediate capes and light vessels. For the successful utilization of the

system it is, of course, indispensable that the more valuable vessels at least be equipped with radio compasses, and it is believed that the additional safeguards resulting from such equipment will bring this about, particularly in view of the growing familiarity with the value of radio apparatus to shipping. As a result of further investigation still in progress by the services mentioned and others, and of actual test and experience, it is expected there will be improvements in this system and further applications of radio signaling for the safeguarding of navigation. It is not probable, however, that, as a result of anything now in sight the extensive system of sound fog signals, such as sirens, whistles, horns, and bells, can be dispensed with, as these are of great value to vessels and boats of every size and description, many of which are not likely to be equipped for receiving radio signals; and furthermore, these furnish warning signals the use of which is not dependent on the operation of any instrument other than the human ear.

### Your EASTER SUIT

is Here Ready For You.

Also, Top-Coat, Shirt, Tie, etc.

Prices Always the Lowest

## CARL WOLF

629 WABASH AVE.



**TERRE HAUTE  
ENGRAVING CO.**

**DESIGNING  
DRAWING  
HALFTONES AND  
LINE ENGRAVINGS**

**TERRE HAUTE, IND.**



NOUVELLE BIBLIOTHÈQUE DE L'UNIVERSITÉ DE LOUVAIN  
LOUVAIN BELGIQUE  
WARREN AND WETMORE ARCHITECTES  
FONDATION BELGE ENTREPRENEURS  
THE FOUNDATION COMPANY

THE Louvain University Library is the testimonial of 1,000,000 American students to their fellow students in Belgium and a memorial to the American students who gave their lives in the great war. It is one of the fine buildings on which The Foundation Company, as general contractor, is rendering complete and efficient service.

*The Foundation Company*, is an organization of construction engineers specializing in the building of difficult superstructures and substructures. The world-wide reputation gained in its early history for trustworthy underground construction has followed it into the field of general engineering contracting. Among the structures completed by The Foundation Company are *buildings of every known type*.

## THE FOUNDATION COMPANY

CITY OF NEW YORK

Office Buildings • Industrial Plants • Warehouses • Railroads and Terminals • Foundations and Underpinning • Filtration and Sewage Plants • Hydro-Electric Developments • Power Houses  
Highways • River and Harbor Developments • Bridges and Bridge Piers • Mine Shafts and Tunnels

ATLANTA  
CHICAGO  
PITTSBURGH

MONTREAL  
SAN FRANCISCO  
LOS ANGELES

LONDON, ENGLAND  
LIMA, PERU  
CARTAGENA, COLOMBIA

PARIS, FRANCE  
LOUVAIN, BELGIUM  
MEXICO CITY

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES



# John S. Cox

## Automobile Supplies

Terre Haute, Ind.

# TERRE HAUTE SAVINGS BANK

Southwest Corner Sixth and Ohio Streets



4 Per Cent Paid on Savings

# J. M. BIGWOOD & SON

Watchmakers and Jewelers

## Eyes Tested Free

by Registered Optician

607 Wabash Avenue

# Ads in This Issue

Theo. Alteneder & Sons  
American Sheet & Tin Company.  
J. M. Bigwood & Son  
Brown & Sharpe Mfg. Company.  
The Brunswick Shop.  
Citizens Independent Telephone Co.  
Clatfelter's  
Bill Cody.  
Cox, John S.  
Craft Book Store.  
Foulkes Brothers  
The Foundation Co.  
Max Frank.  
Freitag-Weinhardt Co.  
General Electric.  
Gillis Drug Company.  
Lee Goodman & Son.  
Grand Theatre.  
Heinl's Flower Shop.  
Hercules Powder Co.  
Hood, A. M.  
Ideal Baking Co.  
Insley Mfg. Company.  
Joseph & Son.  
Kramer Barber Shop.  
Ed. S. Lammers & Company.  
A. B. Mewhinney & Company.  
Mississippi Wire Glass Company.  
McGuire & Shook.  
Myers Bros.  
Otis Elevator Company.  
Rose Polytechnic Institute.  
Sayre & Co.  
Harry T. Schloss.  
Ed. Sparks.  
Terre Haute Engraving Co.  
Tune Bros.  
Walk-Over Boot Shop.  
Wolf, Carl.  
Terre Haute Savings Bank.  
Western Electric Company.  
Westinghouse Electric Company.

Patronize Them

# SAYRE & CO.

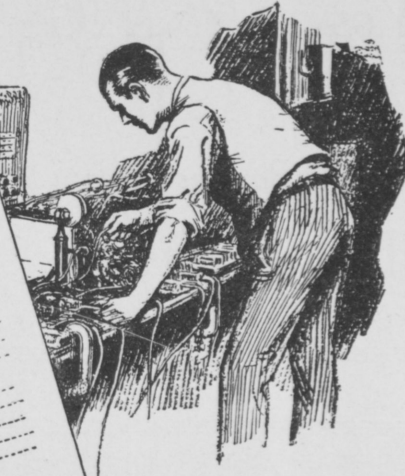
## BICYCLES

AND

## SPORTING GOODS

Fourth and Ohio

"Equip for Your Favorite Sport"



**Your Record**

Name \_\_\_\_\_

Education \_\_\_\_\_

College Activities \_\_\_\_\_

Outside Business Experience \_\_\_\_\_

Type of work preferred \_\_\_\_\_

(see)

## Another call for candidates

in this season of try-outs, seniors will do well to respond to the call for candidates which progressive business organizations are making.

The visit of the various company representatives offers a mutual opportunity. It puts you in position to judge whether a particular company offers sufficient scope to your ability and ambition. The representative can judge, after conversing with you and studying your record, whether you would be well placed in his company.

Do not ignore the invitation to these interviews. Do not be one of those—and they are many—who next Fall will write to the larger companies, "At the time your representative visited my college I did not think that I was interested in the work of your company and so did not meet him".

Men who are earnest in wanting to make the team usually respond to first call

*Published in  
the interest of Elec-  
trical Development by  
an Institution that will  
be helped by what-  
ever helps the  
Industry.*

# *Western Electric Company*

*Since 1869 makers and distributors of electrical equipment*



*For Your SPRING  
HAT or CAP*

*Meet Me Bareheaded*

**BILL CODY**

715 Wabash Ave.

Terre Haute

DON'T SAY

"BREAD"

SAY

**HOLSUM**

IDEAL BAKING CO.

**COLLEGE  
COAT STYLE**

of extreme type is either single or double breasted, straight back without waist suppression and shorter pockets set low as possible.

See Sparks for up to now styles.

**ED. SPARKS**

Tailor and Haberdasher

715 Wabash Ave.

Concrete Handling Equipments,  
Steel Derricks

Industrial Cars  
Inquiries Solicited Covering

ALL CLASSES OF STRUCTURAL  
STEEL FABRICATION

**Insley  
Manufacturing  
Company**  
INDIANAPOLIS

W. H. INSLEY, ROSE '00  
President

A. C. RASMESSIN, '12  
Chief Engineer

E. W. KLATTE, '09  
Asst. Chief Engineer

FRED B. RAY, '20  
Chief Draftsman

No Home  
complete without  
a Telephone

Agent for  
Eastman Kodaks, Cameras  
Film and Supplies

**Gillis Drug Co.**

"THE CUT RATE STORES"

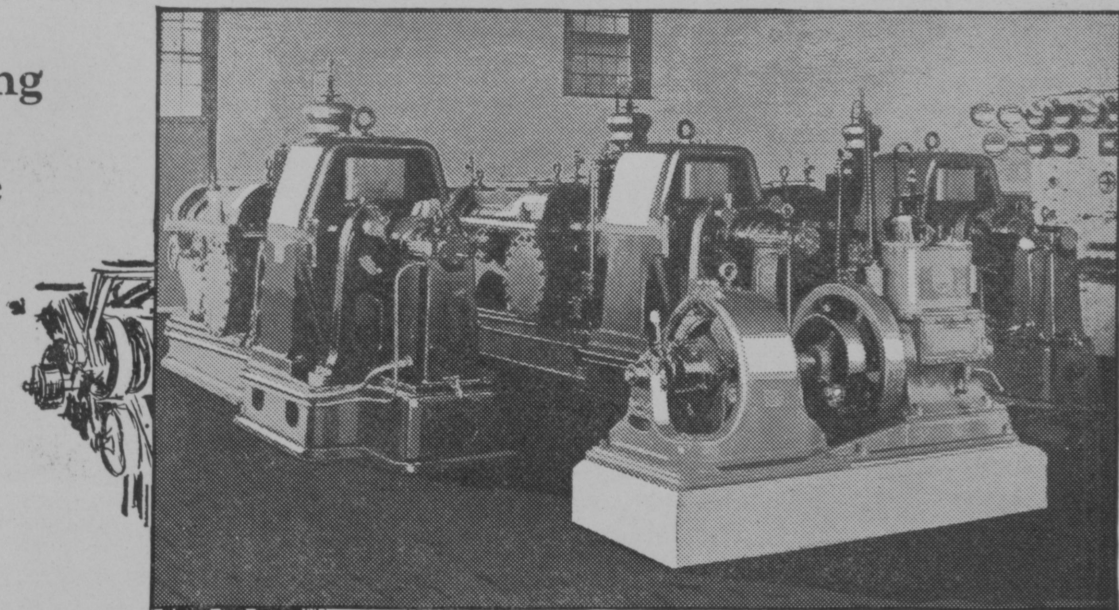
Four Stores

7th and Wabash  
7th and Ohio

412 Wabash  
9th and Wabash

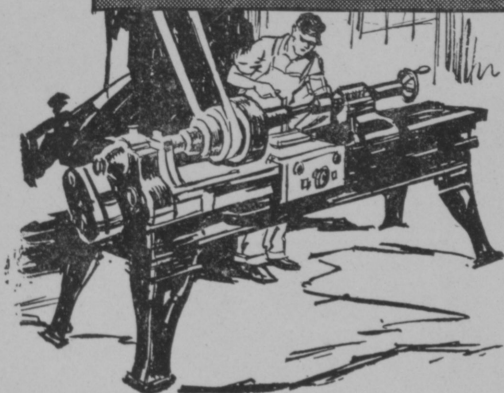
# The Great Engineering Achievement of 1899

What  
Engineering  
Owes to  
Initiative



PRIOR to 1899 the works of the Westinghouse Airbrake Company was operated by reciprocating engines distributed in various parts of the plant. While this source of power was inefficient in many respects, it was the best known commercial motive force of the day.

By 1899, however, remarkable developments had been made in the design and construction of steam turbines and electric generating equipment. Called to the attention of the Airbrake officials, it was decided to give the new machines a chance, and three Westinghouse Steam Turbines were installed without delay. This was the first large installation of its kind, anywhere.



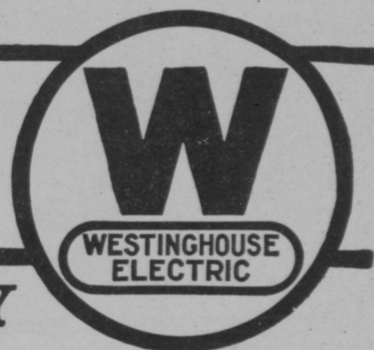
Daddy of All Large  
Commercial Turbines  
Began Operation at  
Wilmerding

It required *initiative* to take this step—someone had to be first. And, as in all important pioneering achievements, there was much skepticism as to results. However, the new units quickly proved their practicability. Although of only 400 K. W. capacity they proved much more efficient and economical than the old reciprocating engines. Their economy was particularly conspicuous because by careful test they showed a fuel saving of approximately 36 per cent.

Steam turbine development thus received its first real impetus in 1899, the Wilmerding, Pa., performance definitely establishing this electrical unit as a *better* method of turning the wheels of industry.

# Westinghouse

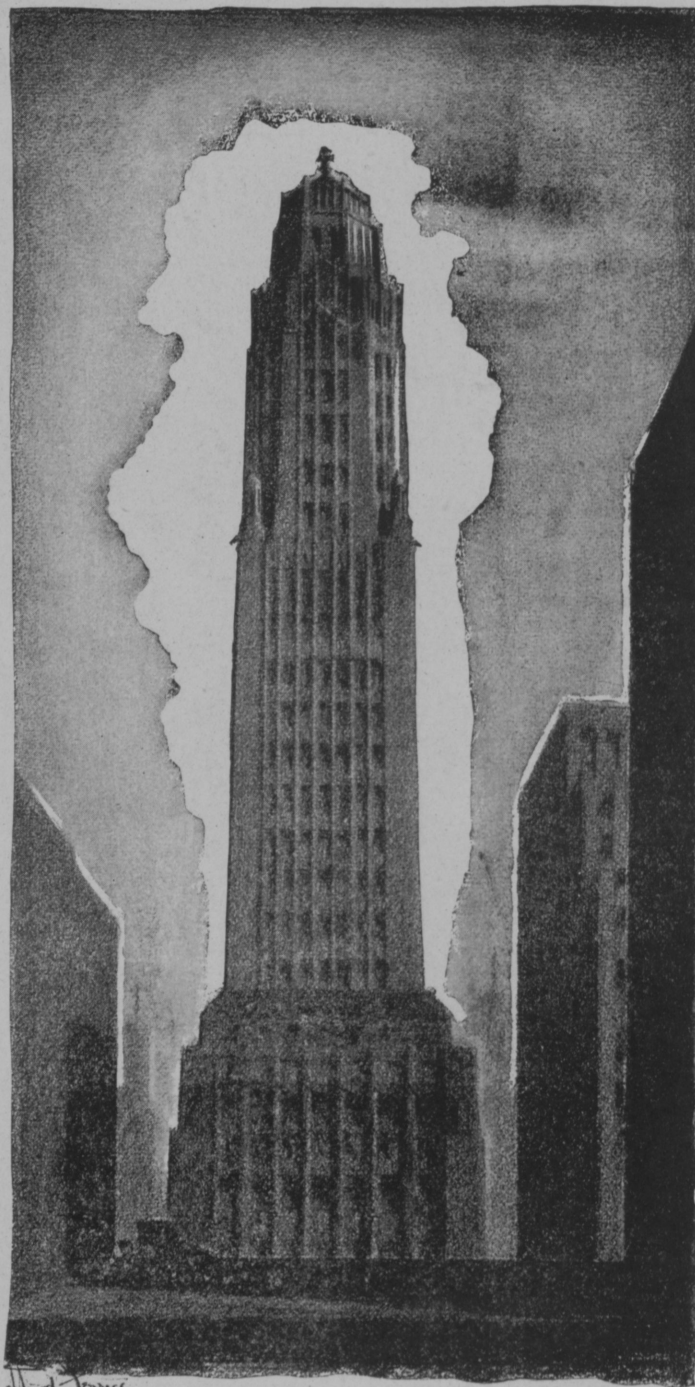
## ACHIEVEMENT & OPPORTUNITY





*The Bush Building*  
New York City  
HELMLE & CORBETT,  
Architects

Drawn by Hugh Ferriss



© O. E. CO.

*"A Noble  
Profile"*

FAR more strongly than most churches, this great tower of commerce bespeaks the real spirit of Gothic architecture—aspiring, rugged, virile—an inspiration for the thinking, creating architect of today. Contradicting the antiquarian, this great tower declares that the spirit of Gothic architecture is a living, organic thing, adaptable to modern problems of accommodation and engineering, and endowed with a future as magnificent as its past.

Certainly modern invention—modern engineering skill and organization, will prove more than equal to the demands of the architecture of the future.

O T I S   E L E V A T O R   C O M P A N Y

Offices in all Principal Cities of the World